April 10, 1934. W. S. REICH 1,954,365

TEMPERATURE CONTROL FOR HEATERS

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Fig. 1

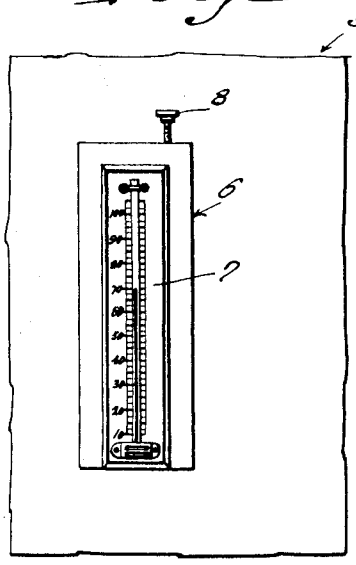


Fig. 2.

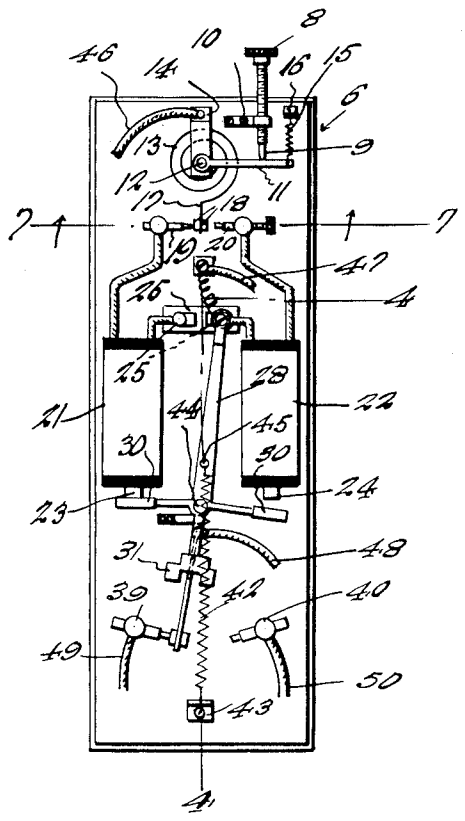
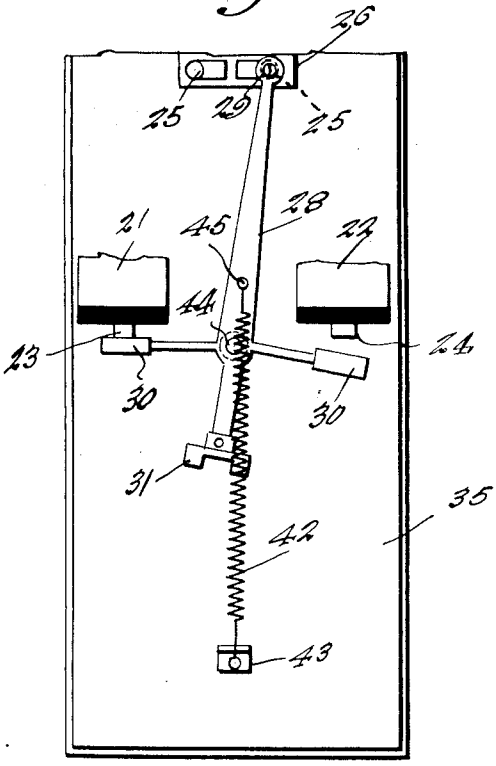


Fig. 3.



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Fig. 4

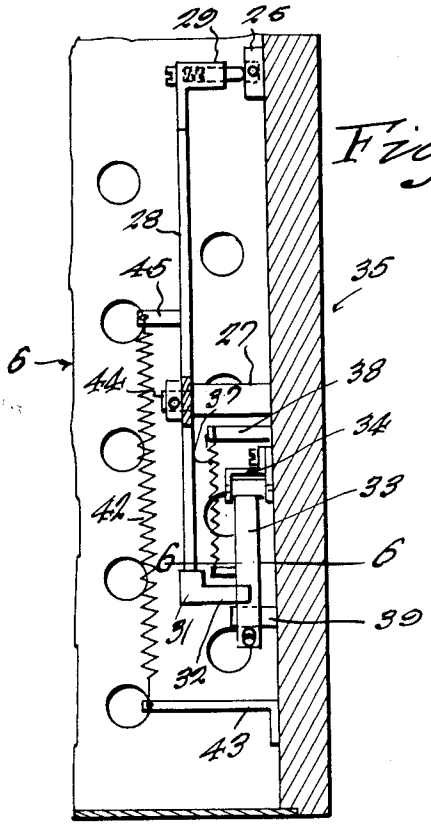


Fig. 5.

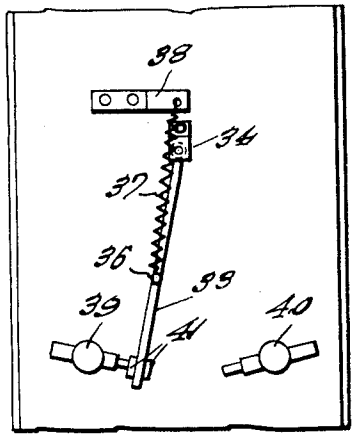


Fig. 6.

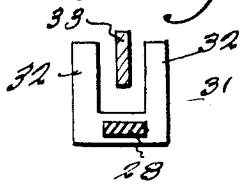


Fig. 8.

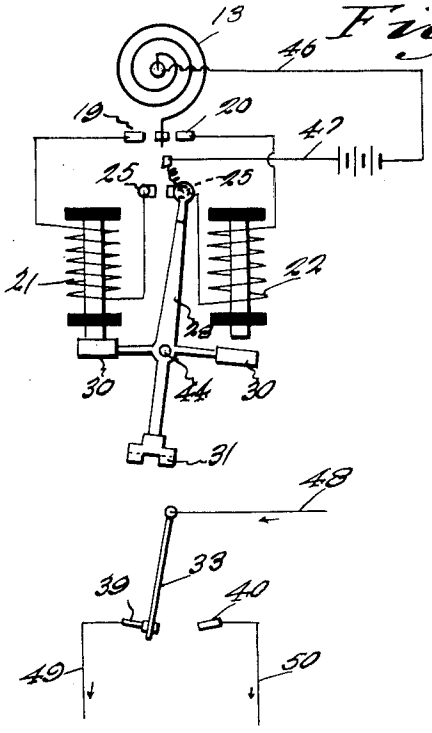
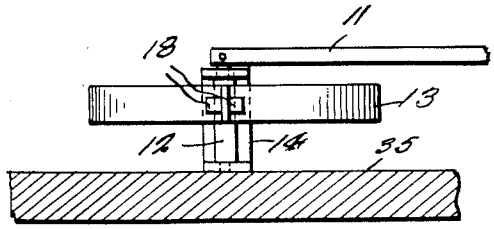


Fig. 7.



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UNITED STATES PATENT OFFICE

1,954,365

TEMPERATURE CONTROL FOR HEATERS

William S. Reich, Lewisville, N. C.

Application March 14, 1931, Serial No. 522,721

4 Claims. (Cl. 200—98)

This invention relates generally to temperature controls for heaters, and particularly to a control of this type operated by room temperature, and adapted to operate one or a plurality of associated devices for increasing or decreasing the heat generated by a heater or heaters.

It is the object of this invention to provide an extraordinarily efficient and positive reacting device of the character described which will be durable and not affected by vibration and other factors which ordinarily disturb devices of this type and prevent their functioning accurately.

It is also an object of this invention to provide a device of the character described which is compact and convenient to install, and which is low in cost of manufacture.

These and other objects of the invention, its nature, and its composition and arrangement and combination of parts will be readily understood by anyone acquainted with the art to which this invention relates upon consulting the following descriptions of the drawings in which:

Figure 1 is a front elevational view of my device installed upon a wall or the like.

Figure 2 is a front elevational view of my device with the thermometer and casing of Figure 1 removed therefrom.

Figure 3 is an enlarged detailed view of the lower portion of Figure 2.

Figure 4 is a vertical transverse cross sectional view taken approximately on the line 4—4 of Figure 2.

Figure 5 is an enlarged detailed view of the lower portion of Figure 2.

Figure 6 is a horizontal sectional view taken approximately on the line 6—6 of Figure 4.

Figure 7 is a horizontal sectional view taken approximately on the line 7—7 of Figure 2, and

Figure 8 is a diagrammatic view of the wiring system of the device of my invention.

Referring in detail to the drawings, the numeral 5 designates generally a support such as a wall and the numeral 6 generally designates a casing of vertically elongated type on the front of which may be disposed a thermometer 7. Projecting through the upper end of the casing 6 is a handle 8 for adjusting the thermostat in the casing to be described.

The handle 8 is part of a screw which projects into the casing 6 and is carried by a bracket 10 secured to the back of the casing. The lower end of the screw has a point 9 which engages the upper side of a dielectric arm 11 which is connected at one end with an adjusting screw 12 of a spiral thermostat 13 of the metallic type the inner convolution of which is attached to the adjusting screw 12 and to the bracket 14 which is mounted to the back of the casing. The dielectric arm 11 is normally retained against the lower end of the screw 12 by a spring 15 which has one end attached to the outer end of the arm 11 and the other end attached to a bracket 16 on the back of the casing. The free end of the spiral thermostat 13 is provided offset as indicated at 17, and on either side of the outer end of the offset 17 are contact points 18. The offset portion is normally disposed between and in spaced relation to a fixed contact point 19 and adjustable contact 20. The numerals 21 and 22 generally designate vertically disposed magnet coils equipped with soft iron cores and exterior protective casings. The cores project downwardly from the casing of the coils 21 and 22 as indicated at 23 and 24. One side of the winding of the magnet 21 is attached to one of the contacts 19, and the other end of the winding is attached to the left hand one of a pair of spaced contacts 25, 25 disposed on a dielectric block 26 and secured to the back of the casing. The magnet coil 22 has one end of the winding thereof connected to the adjustable contact 20 and its other end connected to the right hand one of the contacts 25.

On a standard 27 placed between and slightly below the coils 21 and 22 there is pivotally mounted a contact arm 28 having laterally and inwardly from its upper end an adjustable carbon brush structure 29 for contacting the contacts 25, the arm 28 being arranged to be swung in a manner to be described. The numeral 30 refers to a pair of laterally extending similar armatures carried by the arm 28 in the effective field of the coils 21 and 22 for swinging the contact arm 28. At the lower end of the contact arm 28 is secured an insulated fiber or other material head having a pair of fingers 32 and between which is received a swingable contact member 33 which is pivotally mounted by one end in a bracket 34 (see Figure 5) secured to the back of the casing. In Figure 4 the back of the casing is designated by the numeral 35. The contact member 33 depends downwardly and has attached at an intermediate point 36 thereof one end of a spring 37 whose other end is secured to a bracket 38 mounted to the back of the casing above the bracket 38. The spring 37 helps to swing the contact member 33 into and hold the same in contact with either of a pair of spaced contacts 39 and 40 of the adjustable type. When the arm 28 is swung, it bears against one side of the member 33 with one of its fingers 32 and pushes the contact member 33

away from initial position at first against the tension of the spring 37 which alternately assists the member 33 into engagement with the remaining one of the contacts 39, 40. The initial position of the member 33 is in contact with either contact points 39, 40. The spring 37 resists the displacement of the contact member from initial position but as soon as the member has passed a certain point the spring will swing it into and hold it in contact with the remaining one of the contacts 39, 40. The contact member has its lower end provided with a pair of opposed contact points 41.

A similar spring arrangement is provided for operating the arm 28 in conjunction with the magnets 21, 22. A spring 42 has its lower end fastened to a bracket 43 below the contacts 39, 40 and its upper end secured above the pivotal point of the arm 28 to a pin 45 projecting from the arm. Energizing of either of the magnets 21, 22 will swing the arm 28 from an initial position engaged with one of the contacts 25, 25 against the tension of the spring 42 to a point past center whereat the spring contracts and pulls the arm toward the side opposite its initial position and into engagement with the other one of the contacts 25, 25.

A supply line conductor 46 is electrically connected with the metallic thermostat 13 and a second supply line conductor 47 is electrically connected with the carbon brush 29 of the arm 28 for energizing the coil magnets 21 and 22. A power circuit conductor 48 is electrically connected to the swingable contact member 33, and other power conductors 49 and 50 are connected to the contacts 39 and 40, the conductors 48, 49 and 50 being provided for operating any associated devices such as high voltage heaters and the like, requiring quick connection and disconnection according to the action of the thermostat.

It is obvious that with the device in operating condition contraction or expansion of the thermostat will cause the portion 17 thereof to engage one or the other of the contacts 19 and 20, with the consequence of energizing the corresponding one of the coils 21 and 22 so as to cause swinging of the arm 28 and operation of the swingable contact member 33 so that the member 33 will leave the one of the contacts 39 and 40 with which it was initially engaged and contact the remaining one of the contacts 39, 40, thereby operating either side of a suitably associated power circuit of the type described.

It is to be definitely understood that I do not desire to limit the application of this invention to the particular modification set out herein to illustrate the principles thereof, and any change or changes may be made in material, arrangement and combination of parts consistent with the spirit and scope of the invention.

Having thus described my invention, what I claim as new is:

1. A switch of the type described comprising a base, a pair of electro-magnets on the base, a pair of contacts each of which is connected to one of the terminals of one of said electro-magnets, a swingable armature beam on the base between and in magnetic relation to said electro-magnets, a contact on the beam for selective engagement with said contacts, and a second pair of contacts on the base, a swingable contact maker for cooperation with either of said second contacts, spring means to maintain the contact maker contacted with either of said second contacts, and a dielectric block on said beam arranged to engage either side of said swingable contact member to swing the swingable contact member, upon swinging of the beam, to engage one of the second contacts, said swingable beam being overbalanced so as to be normally engaged with one of the first mentioned pair of contacts.

2. A switch of the type described comprising a base, a pair of electro-magnets on the base, a pair of contacts each of which is connected to one of the terminals of one of said electro-magnets, a swingable armature beam on the base between and in magnetic relation to said electro-magnets, a contact on the beam for selective engagement with said contacts, and a second pair of contacts on the base, a swingable contact maker for cooperation with either of said second contacts, spring means to maintain the contact maker contacted with either of said second contacts, and a dielectric block on said beam arranged to engage either side of said swingable contact member to swing the swingable contact member, upon swinging of the beam, to engage one of the second contacts, said swingable beam being overbalanced so as to be normally engaged with one of the first mentioned pair of contacts, said swingable contact maker being arranged to be substantially in longitudinal alinement with the beam when the beam is at rest.

3. A switch of the type described comprising a base, a pair of electro-magnets on the base, a pair of contacts each of which is connected to one of the terminals of one of said electro-magnets, a swingable armature beam on the base between and in magnetic relation to said electro-magnets, a contact on the beam for selective engagement with said contacts, and a second pair of contacts on the base, a swingable contact maker for cooperation with either of said second contacts, spring means to maintain the contact maker contacted with either of said second contacts, and a dielectric block on said beam arranged to engage either side of said swingable contact member to swing the swingable contact member, upon swinging of the beam, to engage one of the second contacts, said swingable beam being overbalanced so as to be normally engaged with one of the first mentioned pair of contacts, said swingable contact maker being arranged to be substantially in longitudinal alinement with the beam when the beam is at rest, said dielectric block comprising arms located at opposite sides of the contact maker and spaced therefrom when the beam is at rest, said contact maker being arranged to swing in the same direction as the beam when moved thereby.

4. A switch of the type described comprising a base, a pair of electro-magnets on the base, a pair of contacts each of which is connected to one of the terminals of one of said electro-magnets, a swingable armature beam on the base between and in magnetic relation to said electro-magnets, a contact on the beam for selective engagement with said contacts, and a second pair of contacts on the base, a swingable contact maker for cooperation with either of said second contacts, spring means to maintain the contact maker contacted with either of said second contacts, and a dielectric block on said beam arranged to engage either side of said swingable contact member to swing the swingable contact member, upon swinging of the beam, to engage one of the second contacts, said swingable beam being overbalanced so as to be normally engaged

with one of the first mentioned pair of contacts, said swingable contact maker being arranged to be substantially in longitudinal alinement with the beam when the beam is at rest, said dielectric block comprising arms located at opposite sides of the contact maker and spaced therefrom when the beam is at rest, said contact maker being arranged to swing in the same direction as the beam when moved thereby, said contact maker being pivoted near one end on the base and said dielectric block being adapted to engage the same between its pivotal point and the other end thereof, said other end being engageable with the second pair of contacts.

WILLIAM S. REICH.